

NATURAL RESOURCES CONSERVATION SERVICE

VIRGINIA CONSERVATION PRACTICE STANDARD

WETLAND RESTORATION

(Acre)

Code 657

**DEFINITION**

A rehabilitation of a drained or degraded wetland where the soils, hydrology, vegetative community, and biological habitat are returned to the natural condition to the extent practicable.

**PURPOSE**

To restore hydric soil conditions, hydrologic conditions, hydrophytic plant communities, and wetland functions that occurred on the disturbed wetland site prior to modification to the extent practicable.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies to sites with hydric soil which were natural wetlands that have been previously degraded hydrologically and/or vegetatively.

Upon completion, the wetland restoration site will meet the current NRCS soil, hydrology, and vegetation criteria of a wetland.

This practice is applicable only if natural hydrologic conditions can be approximated by modifying drainage and/or artificial flooding of a duration and frequency similar to natural conditions.

If the presence of hazardous waste materials in the sediment or fill is suspected, soil samples will be collected and analyzed for the presence of hazardous waste as defined by local, state, or

federal authorities. Sites containing hazardous waste will not be restored under this standard.

This practice does not apply to: a Constructed Wetland (Code 656) intended to treat point and nonpoint sources of water pollution; Wetland Enhancement (Code 659) intended to rehabilitate a degraded wetland where specific functions and/or values are enhanced beyond original conditions; or Wetland Creation (Code 658) for creating a wetland on a site location which historically was not a wetland or was formerly a wetland but will be replaced with a wetland type not naturally occurring on the site.

**CRITERIA**

GENERAL CRITERIA

The landowner shall obtain necessary local, state, and federal permits that apply before restoration.

Water rights are assured prior to restoration if required.

Establish vegetative buffers on surrounding uplands to reduce the movement of sediment and soluble and sediment-attached substances carried by runoff. Refer to Virginia Conservation Practice Standards *Riparian Herbaceous Cover* (Code 390)), *Riparian Forest Buffer* (Code 391), and *Filter Strip* (Code 393) for establishment of the buffers.

The existing soil, hydrology and vegetative characteristics of the site and the contributing watershed shall be documented prior to restoration of the site.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

## CRITERIA FOR HYDRIC SOIL CONDITIONS

Restoration sites will be located on sites containing a predominance of hydric soils.

If the hydric soil is covered by fill, sediment, spoil, or other depositional material, the material covering the hydric soil shall be removed only to the surface of the buried (or original) hydric soil.

Reestablish an approximation of the original soil microtopography.

## CRITERIA FOR HYDROLOGY RESTORATION

A permanent water supply should be available approximating the needs of the wetlands. The hydrology of the site is defined as the rate, path, and timing of inflow and outflow; and the duration, frequency, and depth of flooding, ponding or saturation.

The maximum hydrology and the overall hydraulic variability of the restored site will approximate the conditions that existed before alteration, e.g., dynamic and static water levels, soil saturation.

Hydrology restoration can usually be accomplished with ditch plugs, tile and drainage breakage and low level dikes (less than 2.5 feet). If drainage area is greater than 20 acres, or the restored wetland contains a base flow which requires a larger dike or pipe structures, refer to the Virginia Conservation Practice Standards *Dike (Code 356)* and *Structure for Water Control (Code 587)*. Refer to the Engineering Field Handbook, Chapter 13, "Wetland Restoration, Enhancement, and Creation," and Chapter 6, "Structures," for additional design information. Existing drainage systems will be utilized, removed, or modified as needed to achieve the intended purpose.

## CRITERIA FOR VEGETATION RESTORATION

The native vegetation shall be restored to the original plant community as the restored site conditions allow. Determination of the original plant community's species and percent

composition shall be based upon reference wetlands of the type being restored or suitable technical reference.

Plantings, seedling, or other types of vegetative establishment will be comprised of native species that occur on the wetland type being restored. Preference shall be given to native wetland plants with localized genetic material. Plant materials collected or grown from material collected within a 200-mile radius from the site is considered local.

In soils where seed banks realistically exist, or where natural colonization of selected native species (identified from reference wetlands) will dominate within 5 years, then natural regeneration can be allowed.

Adequate substrate material and site preparation necessary for proper establishment of the selected plant species shall be included in the design.

On sites which were predominantly herbaceous vegetation prior to modification, and planting and/or seeding is necessary, the minimum number of native species to be established shall be based upon the number of ecological sites present. Sites restored to only one ecological site shall be established with at least four species adapted to the site. Sites with two or more ecological sites (i.e., wet meadow, shallow marsh, or slough eco-sites, etc.) shall be established with at least three native species on each ecological site.

Herbaceous vegetation may be established by a variety of methods including: mechanical or aerial seeding, topsoiling, organic mat placement, wetland sod, vegetative sprigs, wetland hay, etc., over the entire site or a portion of the site and at densities and depths appropriate.

Forested wetland plantings and/or seeding will include a minimum of four tree or shrub species on each ecological site (i.e., low flat, bottom ridge eco-sites, etc.) where appropriate. Tree (and shrub) planting will follow the criteria of Virginia Conservation Practice Standards *Riparian Forest Buffer (Code 391)* and *Tree/Shrub Establishment (Code 612)*.

## CRITERIA FOR WETLAND FUNCTIONS

A functional assessment (Hydrogeomorphic Approach or similar method) shall be performed on the site prior to restoration.

Restoration goals and objectives shall include targeted natural wetland functions for the wetland type and the site location as determined by the functional assessment and reference site data. A post-project assessment will be performed after an adequate period to assess the success of the restoration.

## CONSIDERATIONS

Consider effect of volumes and rates of runoff, infiltration, evaporation, and transpiration on the water budget.

Evaluate the potential for a change in rates of plant growth and transpiration because of changes in the volume of available soil water.

Consider effects on downstream flows or aquifers that would affect other water uses or users.

Consider effects on wetland or water-related resources wildlife habitats that would be associated with the practice. Particularly if threatened and endangered species to be affected, follow guidance in Section I of the Virginia Field Office Technical Guide.

Consider as a high priority those sites adjacent to existing wetlands as they increase wetland system complexity and diversity, decrease habitat fragmentation, and ensure colonization of the site by wetland flora and fauna.

Consider linking wetlands by corridors wherever appropriate to enhance the wetland's use and colonization by the flora and fauna.

Consider the effects of varying water levels in response to potential climatic events such as wet or dry periods.

The nutrient and pesticide tolerance of the plant species planned and should be considered where known nutrient and pesticide contamination exists.

Consider effects of temperature on water resources to prevent undesired effects on aquatic and wildlife communities.

Planning input from Virginia Department of Game and Inland Fisheries' Biologist should be obtained when planning a wetland development adjacent to a cold water stream to ensure that stream water temperature is not adversely affected.

For discharge wetlands (i.e., spring, seeps), consider upslope water/groundwater source availability.

## PLANS AND SPECIFICATIONS

Specifications for this practice shall be prepared for each site. Specifications shall be recorded using approved job sheets, narrative statements in the conservation plan, or other documentation. Requirements for the operation and maintenance of the practice shall be incorporated into site specifications.

## OPERATION AND MAINTENANCE

The following actions shall be carried out to ensure that this practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation), and repair and upkeep of the practice (maintenance):

Any use of fertilizers, mechanical treatments, prescribed burning, pesticides and other chemicals to assure the wetland restoration function shall not compromise the intended purpose.

Biological control of undesirable plant species and pests (e.g., using predator or parasitic species) shall be implemented where available and feasible.

Timing and level setting of water control structures required for the establishment of desired hydrologic conditions or for management of vegetation.

Inspection schedule for embankments and structures for damage assessment.

Depth of sediment accumulation to be allowed before removal is required.

Management needed to maintain vegetation, including control of unwanted vegetation.

Haying and livestock grazing will not be allowed except where necessary to enhance threatened and endangered species habitat (i.e., Bog Turtle). The Virginia Department of Game and Inland Fisheries will be consulted and asked to provide a management plan for grazing, haying, or burning. Upland buffers shall be managed to enhance the functions of the wetlands.

Plastic Pipe, Schedules 40, 80 and 120; and 3034 for Type PSM Poly (Vinyl Chloride) Sewer Pipe and Fittings.

## REFERENCES

1. NRCS, Engineering Field Manual, Chapters 6, "Structures"; 13, "Wetland Restoration, Enhancement, or Creation"; and 11, "Ponds and Reservoirs".
2. Virginia Conservation Practice Standards from Field Office Technical Guide:  
  
*Tree/Shrub Establishment (Code 612)*  
  
*Riparian Forest Buffer (Code 391)*  
  
*Riparian Herbaceous Cover (Code 390)*  
  
*Filter Strip (Code 393)*  
  
*Wetland Wildlife Habitat Management (Code 644)*  
  
*Dike (Code 356)*  
  
*Structure for Water Control (Code 587)*  
  
*Critical Area Planting (Code 342)*  
  
*Pond (Code 378)*
3. GM-190, Part 410, Compliance with NEPA, Subparts A, B, and C, VA Amendment 4. (Includes Form VA-EE-1).
4. 700 Series Earthfill Specification.
5. ASTM Standards 2241 for Poly (Vinyl Chloride) Pressure-Rated Pipe (SDR Series); 1785 for Poly (Vinyl Chloride)

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**Approved Practice Narratives**

(Acre)

**CODE 657**

657 D1 Wetland Restoration: A wetland will be restored at the location shown on the plan map. Re-establish and maintain wetland hydrology and vegetation. Design, operation and maintenance plans will be provided as necessary.

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